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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/698,988	10/31/2003	Brian M. Sager	NSL-014	8858
27652	7590	10/26/2010	EXAMINER	
JOSHUA D. ISENBERG			PATTERSON, MARC A	
JDI PATENT				
809 CORPORATE WAY			ART UNIT	
FREMONT, CA 94539			PAPER NUMBER	
			1782	
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			10/26/2010	
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/698,988

**Applicant(s)**

SAGER ET AL.

**Examiner**

MARC A. PATTERSON

**Art Unit**

1782

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 26 July 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 12-17, 19-22, 25, 26 and 28-38 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 12-17, 19-22, 25, 26 and 28-38 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

**NEW REJECTIONS**

***Specification***

1. The amendment filed July 26, 2010 is objected to under 35 U.S.C. 132(a) because it introduces new matter into the disclosure. 35 U.S.C. 132(a) states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: The phrase 'the random location of pinholes in the layers of the inorganic material and the layers of the organic polymer' is not disclosed in the original specification. The phrases 'requires a tortuous pathway' and 'marked by repeated turns or bends' are also not disclosed.

Applicant is required to cancel the new matter in the reply to this Office Action.

***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 12 – 17, 19 – 22, 25 – 26, 28 – 35 and 37 – 38 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The phrase 'the random location of pinholes in the layers of the inorganic material and the layers of the organic polymer' is not

disclosed in the original specification. The phrases 'requires a tortuous pathway' and 'marked by repeated turns or bends' are also not disclosed.

***Claim Rejections – 35 USC § 103(a)***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 12 - 17, 19 - 26 and 28 - 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brinker et al (U.S. Patent No. 6,264,741 B1) in view of Dams (European Patent No. 1225188) and Burrows et al (U.S. Patent No. 6,866,901 B2) and Fujimori et al (U.S. Patent No. 6,727,513 B2).

With regard to Claims 12 - 13, 16 - 17, 19, 25, 28 - 30, 34 - 36 and 38, Brinker et al discloses an inorganic / organic (column 3, lines 9 - 10) nanolaminate (column 3, line 30) film (column 3, line 66) which has a plurality of layers of an inorganic material (silicate layers, therefore discrete layers comprising multiple layers or lamellae and consisting of silicate and having a different composition from a polymer layer; column 4, line 30) and a plurality of layers each consisting of an organic polymer (column 4, lines 63 - 64), therefore hydrophobic, wherein, the layers of organic polymer alternate with the layers of inorganic material (column 3, lines 15 - 20) wherein the adjacent layers of the film are covalently bonded layers characterized by direct organic polymer - inorganic material covalent bonds (column 5, lines 33 - 35); the inorganic material therefore presents a long and tortuous path to an underlying substrate (tortuous path;

column 5, lines 13 - 15); the organic material is hydrophobic (column 3, lines 15 - 20) and the film is a coating (column 3, line 51) the film is therefore a barrier film; the film comprises a hydrophobic compound (column 4, lines 20 - 25), and therefore has a tuned hydrophobicity that decreases the permeability of the film relative to a film that is hydrophilic; the film has between 100 and 1000 layers (column 3, line 44 - 46); Brinker et al also disclose self- assembly of nanostructures (column 3, lines 3 - 8); Brinker et al also disclose micelle formation and incorporation of polymer precursors into the micellar interiors (column 5, lines 15 - 24). Brinker et al fail to disclose layers that contain superhydrophobic material and comprise fluoroalkylsilane and a solar cell encapsulated with the film.

Dams teaches a monomer comprising fluoroalkylsilane (paragraph 0008), therefore superhydrophobic, for a coating (paragraph 0052) for the purpose of obtaining a coating that is oil repellent (paragraph 0011). One of ordinary skill in the art would therefore recognize the advantage of providing for the monomer of Dams et al in Brinker et al, which comprises a coating, depending on the desired use of the end product.

Burrows et al teach a solar cell (column 5, lines 29 - 30) encapsulated with a barrier film (barrier stack; column 5, lines 44 - 49) for the purpose of obtaining protection from moisture, gas and contaminants (column 5, lines 22 - 25). One of ordinary skill in the art would therefore recognize the advantage of providing for the encapsulation of Burrows et al in Brinker et al, which comprises a solar cell, depending on the desired protection of the end product.

It therefore would have been obvious for one of ordinary skill in the art to have provided for a one or more superhydrophobic layers comprising fluoroalkylsilane in Brinker et al in order to obtain a layer that is oil repellent as taught by Dams and to have provided for encapsulation of

a solar cell in Brinker et al in order to obtain protection from moisture, gas and contaminants as taught by Burrows et al. Because Brinker et al disclose a superhydrophobic material, Brinker et al disclose a material that impedes the movement of water between adjacent layers of the organic polymer and the inorganic material

Brinker et al, Dams and Burrows et al do not establish that it is physically possible to form a self- assembled film using a superhydrophobic monomer, but Fujimori et al teach a self-assembled film (column 3, line 26) comprising fluoroalkylsilane (column 3, lines 45 - 49). Fujimori et al therefore establishes that it is known in the art that it is physically possible.

With regard to Claim 14, Brinker et al disclose a nanolaminate, as stated above, and therefore disclose layers of organic material having a thickness of 1 nm.

With regard to Claim 15, the film disclosed by Brinker et al is transparent (column 3, line 50).

With regard to Claims 20 - 21, the layers disclosed by Brinker et al are hydrophobic, as stated above, and therefore comprise layers made from polymer precursors to which a hydrophobic group comprising methyl has been added.

With regard to Claims 22, 26 and 31 - 33, Brinker et al disclose a Gemini surfactant (column 4, lines 45 - 46) and tubules (column 8, line 6) and layers which are self assembled (column 5, lines 7 - 31).

With regard to Claims 23 - 24, the film disclosed by Brinker et al is utilized a coating, as stated above; Brinker et al therefore disclose an article of manufacture having the film disposed on the surface.

With regard to Claim 37, a solar cell, therefore a photovoltaic device, having an inorganic layer in contact with the photovoltaic device, would therefore be disclosed by Brinker et al.

#### ANSWERS TO APPLICANT'S ARGUMENTS

6. Applicant's arguments regarding the rejections of the previous Action have been carefully considered but have not been found to be persuasive for the reasons set forth below.

Applicant argues, on page 7 of the remarks dated July 26, 2010, that Fujimori et al disclose a self - assembled film that is a single layer, not a multilayer laminate of 100s or 1000s of layers.

However, because Brinker et al do not limit the hydrophobic material that is used as the disclosed organic material, and Fujimori et al teach the formation of a self - assembled film using a hydrophobic material, it would be obvious to use the hydrophobic material of Fujimori et al in Brinker et al.

The declaration of October 30, 2009, states that it would not have been obvious, based on the prior art and prior experiments, to have used a hydrophobic material that is superhydrophobic, because the units generally attract one - another too strongly to self - anneal, and therefore form a structure having many defects which would not form a barrier layer.

However, the hydrophobic material disclosed by Fujimori et al is used in the making of a barrier layer (column 4, lines 46 - 50).

Applicant also argues, on page 11, that Brinker et al fails to disclose that the random location of pinholes in the layers of the inorganic material and the layers of the organic polymer requiring a tortuous pathway and marked by repeated turns or bends are also not disclosed.

However, as stated above, the phrase 'the random location of pinholes in the layers of the inorganic material and the layers of the organic polymer' is not disclosed in the original specification. The phrases 'requires a tortuous pathway' and 'marked by repeated turns or bends' are also not disclosed, although on page 3, lines 25 - 30, it is disclosed that the use of hundreds or thousands of layers combined with randomly located pinholes results in tortuous paths. The amendment therefore constitutes new matter.

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marc A Patterson whose telephone number is 571-272-1497. The examiner can normally be reached on Mon - Fri 8:30 AM - 5:00 PM.



If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rena Dye can be reached on 571-272-1498. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Marc A Patterson/  
Primary Examiner, Art Unit 1782